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THE SURVEY OF AFFECTING FACTORS ON THE ESTABLISHMENT OF KNOWLEDGE MANAGEMENT IN THE CONSTRUCTION INDUSTRY
(CASE STUDY: CONSTRUCTION AND INSTALLARIONS COMPANIES OF TEHRAN)

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ABSTRACT

In the modern business environment, the two main characteristic is its ambiguity and complexity; the organization's competitive advantage depends on the knowledge available to them more than the physical resources. Therefore, knowledge as the most important investment of organizations needs suitable management to give ideas and achieve a sustainable competitive advantage. In line with, this research deals with the extraction of factors affecting the implementation of knowledge management in the construction industry. This descriptive survey study in terms of its application in the field of knowledge management is applied. Required information were collected using a questionnaire with a sample of over 200 experts and managers of construction companies registered in Tehran's construction companies and building mass with simple random sampling. The validity of index and model of study was assessed through CVR test and final testing of the questionnaire was assessed using Cronbach's alpha coefficient. Findings show that there is significant relationship between the organizational culture, information technology of organizational structure and organizational memory with the deployment of knowledge management system in the organization. Respectively, organizational culture (the highest), organizational structure, organizational memory and information technology has a direct and positive impact on the success of knowledge management in organizations.

Keywords: *Knowledge Management, Organizational Culture, Organizational Structure, Organizational Memory And Information Technology*

INTRODUCTION

Today, through entering knowledge age, knowledge management has become an interesting and challenging management science and organizational success has become dependent on their ability to create, acquire, exploit and transfer knowledge. Knowledge management is as a new and valuable approach in conjunction with other business and competitive strategies.

Hence, organizations in order to make use of the opportunities in today's dynamic and competitive business environment can effectively manage knowledge resources to the advantage of the potential benefits. Knowledge management approach to creating a learning organization is an organization whose members can gain knowledge, share and create and take advantage of their decisions.

Therefore, knowledge management as a way of achieving optimal performance in the organization's success and competitiveness in today's benches is required (Lowson, 2003). The need for this type of tool in the management of resources and the success of a strategy to advance the field of competition has been proved; therefore, it should be noted that knowledge management helps the organization in the changes and it needs support and the constant attention. For the implementation and effectiveness of it, which is introduced as the most important element, understanding knowledge management as a spirit is required for the implementation of knowledge management and organizational actions. Therefore it is essential that knowledge management seriously is considered and barriers to its deployment are examined. In such

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circumstances, the importance and value of research in the field of knowledge management is identified and the results of this research can be put in the hands of managers and employees in the construction industry. Accordingly, the first theoretical study has been examined. The theoretical foundations has been about knowledge management that the conducted analyzes have been made for extracting effective components for deployment of knowledge management. In the next parts of the article, the conceptual model and research method are specified. Then, statistical analysis is carried out and finally the conclusions and recommendations are discussed.

THEORETICAL AND EXPLANATION
Definition Of Knowledge Management
Nowadays knowledge management as one of the most interesting and challenging issues in the new millennium and as the form of interdisciplinary field has opened its place in the literature management. Today, all organizations, large and small, need to implement knowledge management in their competition to stay. Kamara et al (2002) argue that today managers realize the importance of knowledge management and know that their competitive edge is not just dependent on natural resources and efficiency in operations. Need to creativity, implement better business practices and customer satisfaction in dynamic environments and the need for knowledge management in the current era has proved a serious way. There are different approaches as well as the complexity of the concept of knowledge management has caused that the definition of knowledge management does not take the same attitude. That's why many experts have seen it from different angles. According to Seemann et al (2000) knowledge management is a clever design of processes, tools, structures etc. with the intent to enhance, repair, or improve the sharing of knowledge which appears in each of the three elements of intellectual capital, the structural, social and human. According to Barclay et al (2006), knowledge management involves determining and identifying intellectual capital in an organization, generating new knowledge for sustained competitive advantage of the organization, providing access to large volumes of data, sharing best performance which is achieved by using technology and all this makes it possible to obtain. Lin and Lee (2005) have defined knowledge management as the process of acquiring, sharing and applying concrete tacit knowledge as corporate assets to encourage innovation and development function.

Dalkyr (2005) defines knowledge management as follows: Knowledge management is a conscious strategy to obtain the proper knowledge to the right people at the right time to help people in sharing and using data in practice that will result in improving corporate performance. For others, knowledge management is the development and acquisition of experience, knowledge and expertise the ability to create new and better system.

According to the above definitions, although there are different ideas of knowledge management, all focused on one thing: that knowledge is an important asset that must be managed. Today, managers are well aware of the importance of knowledge and knowledge management in organizations, and many of them are looking to implement knowledge management in their organizations. At the same time, they are worried that the system cannot implement in their organization and therefore knowledge management fails in their organization (Akhavan and Jafari, 2005). Hence, the present work is to analyze the factors affecting the implementation of knowledge management in the construction and installation companies of Tehran Province. Many organizations realize that to succeed in the challenging world of competitive, they need to integrated and systematic approach to knowledge within your organization. On the importance of knowledge management, it must be said that many of the industrialized, developed and developing countries are resorted to it in order to upgrade skills and find the way to the international market. Now, ability to apply knowledge and skills like intelligence, creating new solutions to meet human needs has found a prominent place in the global system and also knowledge and knowledge creation has become the basis in the development and progress in the world. Based on this, in the future, the prerequisite of a developed society is having developed that gain its actual power by specialists' human resources as

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strategic assets, which the power of the mind is the rule rather than strength of arm. People can bring about enlightening, move and growth of organizations through having the largest power source, thought.

The main objective of the present study is the analysis of the factors affecting the implementation of knowledge management in banks and through it, managers and employees can be able to sync with the organization's goals and beliefs, and also staff and managers believe in its effectiveness. This is the only way that will attempt to remove the barriers.

Research Background

In this section, different ideas and theories of internal and external theorists are examined in the field of the factors affecting the successful implementation of knowledge management: Lee and Choi (2003), considering four factors: structure, culture, human resources, and information technology as enablers of knowledge management evaluate their effect on the knowledge creation process and organizational performance. Success of the effort depending on knowledge management are related to several factors that are divided in five groups of leadership, culture, structure, roles and responsibilities, information infrastructures and measurement criteria. In a research as "an approach to knowledge management strategies and obstacles ahead", Bahadori Fard (2012) studies the effective factors in knowledge management obstacles in the field of human, organizational, cultural, political and technical factors, and concludes that today knowledge management is actually a bridge to leap towards a knowledge-based economy. Today's organizations compete on the basis of knowledge and gain more benefits with the application of knowledge and finally, knowledge needs knowledge managers; Managers who have learned it with the access to the knowledge in a way that will lead to improved organizational performance. Parents et al (2011) completed a study entitled "determination and prioritize the factors affecting the success of knowledge" in Yazd Science and Technology Park and reached the conclusion that the priority of the key factors affecting the success of knowledge management is determined as staffing, strategy, management, organizational culture, processes, and evaluation, and IT. Chen and Huang (2012) in research as "Appropriate knowledge and its application in business performance by analyzing deviations of profile" argue that human resources have an important role in implementing knowledge management activities and the importance of information technology (IT) management is recognized as effective in facilitating knowledge management. Method of the survey is a questionnaire and the results show the holistic perspective between the strategy of knowledge management, IT management strategies and human resource management strategies which has a significant impact on business performance. Abbasi Nezhad (2013) in a research entitled "Identification and ranking of factors affecting the implementation of knowledge management in Customs of Khorram shahr" concluded that there is a significant relationship between organizational culture, organizational memory, and information technology and knowledge resources with implementation of knowledge management. According to the conducted theoretical and experimental studies in the related field and examining different models, the framework of the conceptual model of knowledge management for successful placement was determined. Finally, based on four variables including organizational memory, organizational structure, organizational culture, information technology in the organization, the conceptual model (Figure 1) is designed. After designing the conceptual model about the generality of the model components, relevant professionals and experts from academia, professional and experienced people with at least 15 years' experience in the relevant fields have been surveyed and any needed corrections have been applied based on these ideas. After applying experts' ideas and approving the conceptual model, survey questionnaire had been formulated from the community (sample) for the purposes of statistical research, hypotheses and research questions. Then, managers and experts of organizations in the field of scientific communication between these variables are surveyed.

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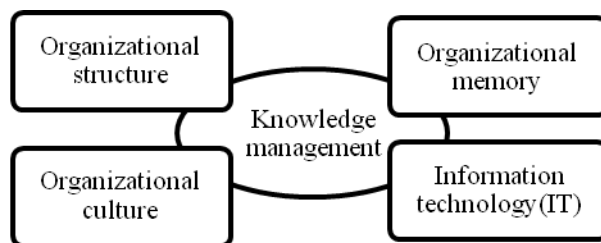
Figure 1: Conceptual model of research

METHODOLOGY
In the present study, given the circumstances of this study, the research method is survey research and because of its application in the field of knowledge management, it is an applied research component. Questionnaire was used to collect data. In this study, likert scale method is the main factor influencing knowledge management and questions contains grades of five-choice response (1- very low, 2- low, 3- medium, 4- high, 5- very high) and the arrangement of the measurement items of the research variables in the community questionnaire is expressed in Table 1.

Table1: Arrangement Of The Measurement Items Of The Research Variables In The Questionnaire

Row	Indicators	Number of questions
1	Assessment of organizational culture	9
2	Assessment of organizational structure	5
3	Assessment of organizational memory	10
4	Assessment of information technology	8
5	Total	32

In addition to the above questions, the respondents' demographic data, including age, education, organizational position and work experience is also asked in the designed questionnaire.

Evaluation Of The Reliability And Validity Of The Questionnaire
Since Cronbach's alpha is usually an appropriate indicator for assessing the reliability of measuring instruments and internal consistency among its elements, the reliability of the questionnaire used in this study is evaluated using Cronbach's alpha and SPSS15 software which is shown in Table (2). Since the variables of this study have had Cronbach's alpha above 0.7, they have necessary assessment of reliability. To assess the validity or reliability of the questionnaire in this study, the content validity of CVR method is used according to Lawshe's model in order that whether the questions and instruments contained in it measures the subject of the study and variables precisely. Before the final adjustment and duplication of the questionnaire to evaluate the reliability and validity of the questionnaires, the initial questionnaire is tested over 15 experts in the statistical sample and the overall average obtained for the components affecting KM is respectively0.69, which is an acceptable level since the amount of CVR for expert assessment and evaluation is 0.49 based on the table of Lawshe (1975).

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Statistical Community (Sample)

The statistical population of the study is senior, middle managers, and experts in construction companies registered in the association of construction companies and facilities in Tehran in 2013. Among these companies, 211 people are senior managers and 372 people are middle managers and experts. Thus, the study sample consists of 583 senior managers, middle, and experts of construction companies registered in the association of construction companies and facilities in Tehran.

Determination Of Sample Volume

To determine the sample size of the statistical population, Cochrane and Sharp's sampling equation which is as follows is used:

$$n = \frac{583\,(1.96)^2 \times 0.5 \times 0.5}{583\,(0.05)^2 + (1.96)^2 \times 0.5 \times 0.5} = 250$$

Formula (1)

According to the above formula and the error level of 0.05, the sample volume would be 250 people and the sample allocation to each of the two categories (1 - senior managers and 2- middle managers and experts) is calculated by the following formula:

Formula (2)   Sample volume of senior managers $= 250 \left(\frac{211}{583}\right) = 90$

Formula (3)   Sample volume of middle managers and experts $= 250 \left(\frac{372}{583}\right) = 160$

Analysis of Data

Descriptive analysis (one variable) population characteristics:

A) Age

Table 4: Distribution of Respondents Based on Age

Age (year)	Percent	Cumulative frequency
Lower than 30	10	10
30- 39	33.8	43.8
40- 49	50.7	94.5
50 and older	3.5	98
Unanswered	2	100
Total	100	

The age distribution of the study population reflects the fact that the average age is in the age group of 40 to 49 years. Also the highest accumulation of respondents is seen in the age group of 40 to 49 years and the lowest accumulation is seen in the age group of 50 years and older.

B) Gender

Of the respondents under investigation in this study, respectively; 81/6 percent were male and 14/2 percent was female which were selected using a stratified sampling method.

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Table 5: distribution of respondents according to the gender

Gender	percent	Cumulative frequency percent
Male	81/6	81/6
Female	14/2	95/8
Unanswered	4/2	100
Total number	100	

C) Level of education

Table 6: Distribution of respondents according to the Level of education

Level of education	percent	Cumulative frequency percent
PHD	1/8	1/8
Master degree	56/1	57/9
Bachelor degree	30/2	88/1
Associate Degree	10/6	98/7
unanswered	1/3	100
Total number	100	

Respondents under investigation in this study, respectively; 1/8 percent has Associate degree, 56/1 has bachelor degree, 30/2 percent has master degree, and 10/6 percent has PHD degree. Distribution of The educational level of statistical society reflects the fact that each respondent on average for has a bachelor's degree. Also most accumulation was in bachelor degree and the lowest accumulation was in associate degree.

D) Organizational position

Table 7: distribution of respondents according to the organizational position

Organizational position	Percent	Cumulative frequency percent
Middle managers and experts	63/9	63/9
Supervisor, Chairman, senior managers	36/1	100
Total number	100	

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From the respondents under investigation in this study, respectively; 63/9 percent was middle managers and experts and 36/1 percent was supervisor, chairman and senior manager.

E) Working experience

Table 8: distribution of respondents according to working experience

Working experience (year)	Variable percent	Cumulative frequency percent
Below 5 years	6/4	6/4
5- 10	24	30/4
11 – 20	56	86/4
21 – 25	3	89/4
26 – 30	8/5	97/9
Unanswered	2/1	100
Total number	100	

From the respondents of this study most of the respondents have working experience between 11 to 20 (56 percent), and the lowest accumulation of respondents had working experience between 21 to 25 (3 percent).

Deductive analysis (2 variables Analysis)

In two variables analysis according to the fact that variables , first be Kampiot(in the distance level) and then Rikot (in sequential measure level) and considering that with Rikot , variables and components two variable analysis takes place; Therefore, the coefficients of Tao Kendal used For a significant correlative relationship to generalized larger statistical population. Also, in order to testing and Evaluation of correlation use of the Samers coefficient. In table 9 indicates the Distribution coefficients, amount and significance level and affecting variables on implementation of Knowledge Management.

Table 9: Distribution Coefficients, Amount And Significance Level of Effective Factors on Implementation of Knowledge management

Variable	Coefficient	Amount of coefficients	Significance level
there is a significant relationship Between organizational memory and knowledge management system implementation in construction companies	Kendall's tau	0/53	0/000
	Somers d	0/47	0/000
There is a significant relationship between organizational structure and implementation of knowledge management systems in construction companies	Kendall's tau	0/47	0/000
	Somers d	0/45	0/000
There is a significant relationship between organizational culture and implementation of organizational knowledge management system in construction firms	Kendall's tau	0/82	0/000
	Somers d	0/63	0/000
Between information technology and the implementation of Knowledge Management systems in construction companies, there is a significant relationship	Kendall's tau	0/35	0/000
	Somers d	0/33	0/000

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According to the findings of table 9 the following conclusions may be drawn:

1- There is a significant relationship between organizational memory variable and implementation of knowledge management system in Statistical population under study with error level of 0/01. Kendall's tau coefficient with the amount of 0/53 represents the middle correlation between two mentioned variables. Also degree and intensity of this relationship according to Samers d coefficient was 0/47 that shows direct and relatively moderate relationship.

2- There is significant relationship between the Components of the organizational structure and implementation of knowledge management system in statistical population under study with error level of 0/01. Kendall's tau coefficient with the amount of 0/47 represents the middle correlation between two mentioned variables. Also degree and intensity of this relationship according to Samerz d coefficient was 0/45 that represents direct and relatively moderate relationship.

3- There is a significant relationship between the components of organizational culture and implementation of knowledge management system in statistical population under study with error level of 0/01. Kendall's tau coefficient with the amount of 0/82 represents the middle correlation between two mentioned variables. Also degree and intensity of this relationship according to Samers d coefficient was 0/63 that represents direct and relatively moderate relationship.

4- There is a significant relationship between information technology components and implementation of knowledge management system in statistical population under study with error level of 0/01. Kendall's tau coefficient with the amount of 0/35 represents the middle correlation between two mentioned variables. Also degree and intensity of this relationship according to Samers d coefficient was 0/33 that represents direct and relatively moderate relationship.

Therefore, according to the two variables analysis and test of the research hypothesis in the first step, all of the research hypotheses are confirmed.

Inferential analysis (Multivariate Analysis: Regression analysis)

Table (10) represent Multivariate regression model of Organizational innovation. In addition table (11) determines Indicators and statistics of regression analysis.

Table 10: Multivariate Regression Model For Knowledge Management Implementation

Variables were entered into the equation					
Variables	**Non-standardized coefficients**		**Standardized coefficients**	**The amount of t**	**Significant level of t**
	B	**Standard error**	**Beta**		
Width From the origin	20/560	2/196	-	2/363	0/000
Organizational Culture	1/143	0/115	0/523	5/576	0/000
Organizational structure	1/081	0/116	0/357	11/710	0/000
Organizational Memory	0/786	0/067	0/186	7/761	0/000
Information Technology	0/849	0/072	0/112	15/304	0/000

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Table 11: Indicators And Statistics of Regression Analysis of Knowledge Management Implementation

Entry method variables	Method: Enter
Individual correlation coefficients	M.R= 0/887
The coefficient of determination	R^2=0/744
The coefficient of Real determining	$R^2 .adj_{46} = 0/7$
Deviation or standard error	S.E= 3/949
Analysis of Variance	ANOVA= 325/040
Significance level of F	Sig= 0/000

As can be seen In Table 11, the coefficient of multiple correlation is M.R=0/887, The coefficient of determination(R Square) is equal to R=0/738, and The real coefficient of determination equal to 0/744 and This indicates that almost 74% of the variance and changes of the variable in implementation of knowledge management By components exist in the equation, i.e., organizational culture, organizational structure, organizational memory and information technology can be explained and predicted.

The data in Table 10 indicates the fact that the component of organizational culture with the foundation of 0/52 more than other three components of organizational structure, organizational memory and information technology affect on implementation of knowledge management system; the direction of impact of this component is positive and direct and represent the fact that the more will be organization culture component in Construction Companies; the more the amount of implementation of knowledge management system in organization. Furthermore, organizational structure component and organizational memory after organizational culture sequentially with the foundation of 0/36 and 0/19 affect the implementation of knowledge management system; the direction of impact of this component is direct and positive and shows the fact that the more organizational structure and organizational memory improve in a organization; the more will be the amount of implementation of knowledge management system. Finally information technology component in organization with the foundation of 0/11 have the least amount of affection in variable on implementation of knowledge management system in organization. The direction of impact of this component is positive and direct.

The results of multiple regression analysis of the above variables can be written in standardized mathematical form as follows:
Formula (4)

$$Y = \beta_1 Z_{1i} + \beta_2 Z_{2i} + \ldots\ldots + \beta_k Z_{ki} + \acute{E}_i$$

Y= 0/11 information technology + 0/19 (organizational memory) + 0/36 (organizational structure) + 0/52 (organizational culture) + $0/15_E$
According to the above regression model; the following points became clear for us:
   1- Information Technology with the degree of 0/11 affects the implementation of knowledge management system. This entry would indicate that for every unit increase in the amount of

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organizational memory 0/11 will be added to the amount of implementation of knowledge management systems in organization.

2- Organizational memory with degree of 0/19 affects the implementation of knowledge management system. This entry would indicate that for every unit increase in the amount of organizational memory 0/19 will be added to the amount of implementation of knowledge management systems in organization.

3- Organizational structure with the degree of 0/36 affects the implementation of knowledge management system. This entry would indicate that for every unit increase in the amount of organizational structure 0/36 will be added to the amount of implementation of knowledge management systems.

4- Organizational culture with the degree of 0/52 affects the implementation of knowledge management system. This entry would indicate that for every unit increase in the amount of organizational culture 0/52 will be added to the amount of implementation of knowledge management systems.

Therefore, according to multivariate regression, all minor assumptions of the research based on the fact that there is significant impact between components of organizational memory, organizational culture, organizational structure and information technology with implementation of knowledge management system is approved. Also The culture of the organization with the relative contribution 0/52 have greatest impact on the implementation of knowledge management system.

CONCLUSION
Due to the importance of knowledge as the most important competitive advantage in today's organizations, Implementing of knowledge management do not left any doubt for managers of organizations as strategic binding. Today, the largest ambition of organization is defining a proper knowledge management system and successful management. Based on this study, due to the strategic importance of knowledge for construction companies And the lack of a comprehensive model of knowledge management In order to establish a proper system of management that is tested empirically in this corporate, a model is presented. Therefore, this paper investigates the relationship between organizational culture, organizational structure, organizational memory and information technology with the establishment of knowledge management in organization and Extraction of the relative impact of each of these components in the implementation of knowledge management system based on regression analysis has been studied. The following results are obtained:

1- Improvement in the organizational culture on the implementation of knowledge management in organization has significant and direct effect (confirm the first hypothesis).

2- Improvement of organizational structure on the implementation of knowledge management system has significant and direct effect (confirm the second hypothesis).

3- Improvement of organizational memory on implementation of knowledge management has significant and direct effect (confirm the third hypothesis).

4- Improvement of information technology on implementation of knowledge management has significant and direct effect (confirm the forth hypothesis).

In addition, in determining the relative contribution of each influential component in explaining and predicting of knowledge management implementation logically, knowledge management respectively affected by "organizational culture" , "organizational structure", "organizational memory", and " information technology" components that they are important in properly implementation of knowledge management.

The results obtained from the study of factors affecting the implementation of knowledge management in this article are similar to research results by Lee and Choi (2003), Bahadori Fard (2012), Olia and et al (2011), Salavati, Hagnazar, Rabii& Norouzi (2000), Beikzadeh and Dudman Maleki (2011), Chen , and Hung (2012), Abbasi Nezhad (2013), and Jafari and et al (2011), performed based on what is in the

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background of the research. Mohammadi and et al (2009) found in their the research, study the systematic organizational readiness for implementing knowledge management in small and medium organizations, they have considered five factors effective in successfully implementing knowledge management , Include : Management of Change , Infrastructure Support change and culture knowledge. So the results of this research are consistent with previous research findings that are mentioned above and empirically reinforce them. The most important limitation of this research that the researcher encountered in this study can be mentioned as unconcern and disregarding of respondents in providing information to complete the questionnaire, which pursued diligently and overcome through using behavioral techniques. Due to the need to keep pace with rapid technological change and global competition for organizations, Planning programs to implement knowledge management in organizations, Management support of knowledge management practices, And also organizes conferences and seminars to acquaint managers with this concept can lead organizations toward higher growth and competitiveness. Considering that must be a proper mapping established between the recommendations and findings, Following recommendations to achieve better level of preparedness are available for the implementation of knowledge management systems. Accordingly, it is recommended that the more managers take care of organizational infrastructure in order to enabling knowledge management process specially organizational culture (according to the findings of the study has the most effect in implementation of knowledge management) and it is required to the company managers to create a collaborative culture to share knowledge and work together to provide a good platform for the implementation of knowledge management. Also all the basic infrastructure provided in the study scrutinize and review by the managers and applied in the organization. In addition, since the present study in construction companies which are private companies that have been conducted, it is suggested that in future research by doing research on public companies and comparative study between the results obtained from public and private companies reach to different results.

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